

Motivating Students for Project-based Learning for Application of Research Methodology Skills

Abstract

Introduction: Project-based learning (PBL) is motivational for students to learn research methodology skills. It is a way to engage and give them ownership over their own learning. **Aims and Objectives:** The aim of this study is to use PBL for application of research methodology skills for better learning by encouraging an all-inclusive approach in teaching and learning rather than an individualized tailored approach. **Methodology:** The present study was carried out for MBBS 6th- and 7th-semester students of community medicine. Students and faculties were sensitized about PBL and components of research methodology skills. They worked in small groups. The students were asked to fill the student feedback Questionnaire and the faculty was also asked to fill the faculty feedback Questionnaire. Both the Questionnaires were assessed on a 5 point Likert scale. After submitted projects, document analysis was done. **Results:** A total of 99 students of the 6th and 7th semester were participated in PBL. About 90.91% students agreed that there should be continuation of PBL in subsequent batches. 73.74% felt satisfied and motivated with PBL, whereas 76.77% felt that they would be able to use research methodology in the near future. **Conclusions:** PBL requires considerable knowledge, effort, persistence, and self-regulation on the part of the students. They need to devise plans, gather information evaluate both the findings, and their approach. Facilitator plays a critical role in helping students in the process by shaping opportunity for learning, guiding students, thinking, and helping them construct new understanding.

Keywords: Knowledge, project-based learning, research methodology

Introduction

Project-based learning (PBL) motivates students to connect with content areas text while increasing their knowledge of a topic. It is a way to engage and give them ownership over their own learning.^[1] Teaching research methods to undergraduates presents a number of dilemmas, including the development of effective means of providing students with practical research experience, and the difficulty of engaging the interest of students in a subject which for many is not intrinsically appealing and to which some have a long-standing version.^[1] PBL places students in realistic, contextualized, problem-solving environments. In so doing, projects can serve to build bridges between phenomena in the classroom and real-life experiences. The question and answers that arise in their daily enterprise are given value and are shown to be open to the systematic enquiry. Hence, project-based education requires active engagement

of the student's effort over an extended time. They also promote links among subject-matter disciplines and present an expanded, rather than a narrow view of the subject matter.^[2] This method of instruction allows students to choose and create own authentic assignments to demonstrate their knowledge of a topic. PBL engages literacy skills of students from reading, writing, speaking, and synthesis of information. By giving students ownership over their learning and having them choose their way to demonstrate their understanding, they are motivated to complete a given task in applying research methodology skills in community- or hospital-based projects.

Methodology

The present study was carried out in the Department of Community Medicine/PSM for 6th- and 7th-semester MBBS students. The permission was taken from HOD, Dean, and IEC of the college.

A total of 99 students were participated in the study, in which 57 were girls and

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42 were boys. The study was done with the objectives of short-term and long-term for the students and the faculty to assess the increase motivation of the students for PBL by understanding and applying the various components of research methodology skills and assess improvement in skills of the students on group dynamics, team-based learning, analytical skills, project presentation, and report writing skills during their project work in the department of community medicine. Along with this, assessment of the enhancement of teacher–student interaction and peer-group interaction during PBL and assessment of the update of knowledge on the subject on which the project is based.

The material on research methodology was prepared and the first sensitization workshop was done with the faculty members of the PSM Department, and they were introduced to the concept of PBL and identification of problems and various components of research methodology skills, group dynamics, communication skills, its assessment, and the possible utility for the students and teachers. The faculty feedback was taken on five-point Likert scale ranging from poor, fair, good, very good, and excellent, and the data were collected on the faculty feedback form. The faculty feedback was also taken in relation to their self-improvement after the completion of their group project.

The whole batch was divided into 13 groups, each with a facilitator. The groups were made according to the roll number, and also depending on the hierarchy of the department, the facilitators were nominated. Each group had 8 members while the first three hierarchical members had 9 students.

The students were oriented regarding the PBL and the components of research methodology skills by interactive class by suitable examples. The students were informed and informed consent was taken.

After that, they worked in their small groups using group dynamics and wrote their individual projects in the group with their facilitator. After submission of the project in

a spiral-bound form, the students were asked to fill the Student Feedback Questionnaire on a five-point Likert scale.

The copies of all the questionnaires were designed, modified, pretested, and validated by departmental and other colleagues, 2016 fellows, 2015 fellows, faculty advisors, and our guides. After the collection of all the 13 projects, the document analysis was done. The data were collected, and analysis was done using descriptive analysis and qualitative methods of analysis.

Results

A total of 99 students of the 6th and 7th semester were participated in the PBL, in which 57 were girls and 42 were boys. As shown in Table 1, 90.91% (35.35% and 55.56% were strongly agreed and agreed, respectively) students gave their consent for the continuation of PBL in subsequent batches, and 57.58% felt that they would be able to use these components of research methodology in the future.

Students were inclined to use group dynamics and team-based learning in project designing and working in small groups [Table 2]. Students admitted to have enhancement of knowledge on the topic taken, searching review for that topic, improved communication skills, data collection skills, and analytical and presentation skills [Table 3]. Faculty-based perceptions for session rating were done regarding various components of research methodology skills, and almost all the sessions were ranked excellent.

Perceptions of faculty on enhancement of different skills such as problem-solving skills, reasoning, analytical, communication skills, and self-improvement were assessed. It was observed that there was 100% enhancement of knowledge on the various components of research methodology, update of the knowledge on a particular topic, and increase interaction with the students by the facilitator for the discussion on the topic till the completion of the project. The facilitators also felt to do further research

Table 1: The perception of students on project-based learning

Item of questionnaire	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree
Continuation of PBL in subsequent batches	35 (35.35)	55 (55.56)	7 (7.07)	2 (2.02)	0
Satisfied and motivated with PBL	21 (21.21)	52 (52.53)	22 (22.225)	4 (4.04)	0
Able to use components of research methodology in future	19 (19.19)	57 (57.58)	23 (23.23)	0	0

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Table 2: The perception of students on group dynamics and team-based learning

Questionnaire item	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
Use of group dynamics in project designing	19 (19.19)	64 (64.65)	12 (12.12)	3 (3.03)	1 (1.01)
Views of working in small groups	24 (24.24)	60 (60.61)	11 (11.11)	3 (3.03)	1 (1.01)
Views regarding team-based learning in project	22 (22.22)	55 (55.56)	17 (17.17)	4 (4.04)	1 (1.01)

projects, encouraging students for PBL for the subsequent batches, and at the end, they were very happy and satisfied when the students successfully completed their projects.

Figure 1 shows the views of the students regarding pursuing academics learnt into real-life situations, in which 68.69% agreed and 18.18% strongly agreed. Figure 2 shows the views regarding increase in interaction with the facilitator in the small group which was showing the views of the students equally, that is, 46% in each regarding strongly agreed and agreed.

The document analysis was done after receiving all the submitted projects in a spiral-bound form of all the 13 groups which showed that among all the projects, 10 (76.93%) were based on students of various background as nursing students, school students, and college-level students, whereas 2 (15.38%) were based on community setting and 1 (7.69%) was hospital based. Document analysis of all the submitted projects showed that all the components of research methodology skills have been used.

Discussion

PBL as suggested by Bell^[3] engages literacy skills of students from reading, writing, speaking, and synthesis of information, and they are motivated to complete a given

task. The enhancement of knowledge on which the project was based was seen in the students, in which 58.59% agreed and 39.39% strongly agreed. About 61.62% agreed and 15.15% strongly agreed that their confidence was enhanced for searching the review of literature on which the project was based. Jones^[4] commented that the students put their effort on learning because they like what they are doing, so they spend more time and effort on it.

Bruce^[5] (1984) stated that students interact with each other, and PBL is a method of teaching that can engage students in a social setting, therefore, helping students to improve and practice their literacy skills. Students are engaged in creating project together and communicating the results to the people around them. They are working in small groups and 60.61% agreed while 24.24% strongly agreed. They are collaborating with others also. 50.51% agreed and 32.32% strongly agreed that there was enhancement of communication skills.

Kelly^[6] stated that PBL motivated students to read content area text. The data were collected through observations of Student Questionnaire and Project Presentations. It showed that the students were motivated to read content area text because they were allowed to work collaboratively and were given choices through PBL. Facilitators foster the development of essential skills in the students.

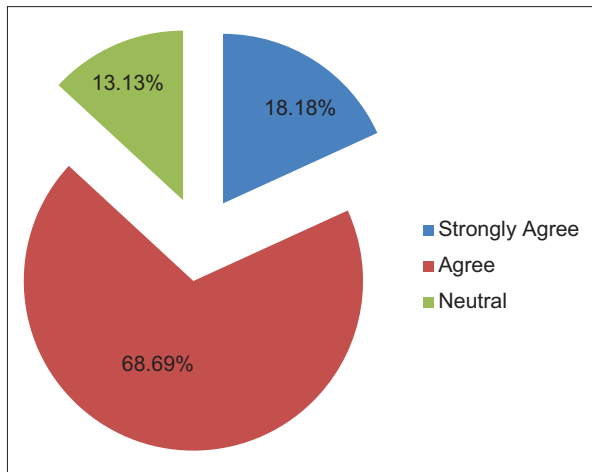


Figure 1: Perceptions regarding pursuing academics learnt into real-life situation during project-based learning

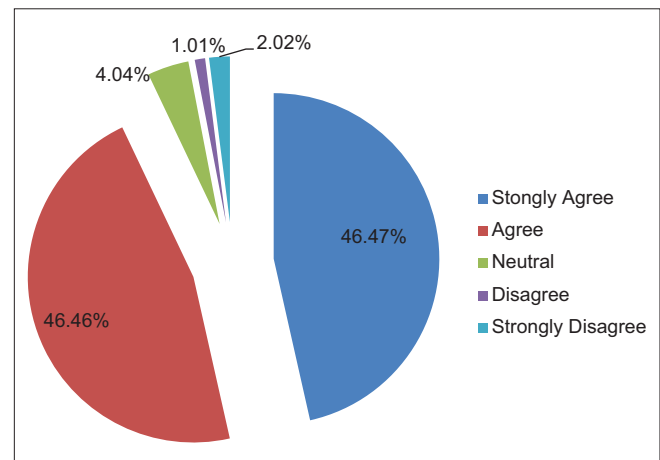


Figure 2: Views regarding increase interaction with facilitator in small group

Table 3: The perception of students regarding enhancement of knowledge and different skills

Item of questionnaire	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree
Enhancement of knowledge on which the project was based	39 (39.39)	58 (58.59)	2 (2.02)	00	00
Enhancement of confidence by PBL	29 (29.29)	57 (57.58)	12 (12.12)	1 (1.01)	00
Enhancement of confidence for searching review of literature	15 (15.15)	61 (61.62)	22 (22.22)	1 (1.01)	00
Enhancement of communication skills by PBL	32 (32.32)	50 (50.51)	15 (15.15)	2 (2.02)	00
Enhancement of data collection skills	26 (26.26)	62 (62.63)	11 (11.11)	00	00
Enhancement of analytical skills	18 (18.18)	64 (64.65)	17 (17.17)	00	00
Enhancement of presentation skills	22 (22.22)	61 (61.62)	16 (16.16)	00	00

PBL: Project-based Learning

Pflaum and Bishop^[7] stated that when the students work as a team through PBL, then they are exploring and finding new information together.

Sizer^[8] viewed that students undergoing PBL investigate and seek resolution to the problems they view and understand the key principles and concept. Projects are adaptable to different types of learners and learning situations. In this study, 68.69% agreed and 18.18% strongly agreed for the same.

Blumenfield *et al.*^[2] stated that PBL places students in realistic, contextualized, problem-solving environments. The same type of learning was seen in this study also.

Brophy and Alleman^[9] suggested the feasibility of the project also matters and to complete the project with the available resources in a manageable time. In this study also, they completed in the stipulated time, so that the document analysis was made easier.

Hammond^[10] viewed that critical thinking is enhanced by the PBL in the classroom. Students research information on a particular topic in great depth to create their culminating project. They moved beyond the basic factual knowledge of the topic and begin to delve deeper and think critically about the topic. In the present study, when the students were creating awareness on a particular topic, their knowledge was appreciated by the community and they themselves were much satisfied with it.

Scott Wurdinger *et al.*^[11] quoted that PBL taps into students interest by allowing them to create projects that result in meaningful learning experiences.

Limitations

1. Time given to the students was short
2. As in some project, the study area was too far and the students were not provided with the college conveyance, so they faced certain difficulties
3. As the initial plan was to take 101 students, but 2 students were not able to participate due to some administrative reasons.

Conclusions

PBL had helped students for applying research methodology skills. It has also helped in increasing their confidence level and updating their knowledge on the concerned topic with their increase of enhancement of communication skills, data collection, and analytical and presentation skills. It has also given a preview on group dynamics and team building

among themselves during their project-based designing and working in small groups.

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Conflicts of interest

There are no conflicts of interest.

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